

Application No.: 09/644,556
Reply to Office Action of: June 19, 2003
Amendment Dated: September 22, 2003

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS

1. (Currently Amended) A stabilized monomer composition, comprising:

(A) (i) at least one (meth)acrylic acid amide selected from the group consisting of N,N-dimethylaminopropyl methacrylamide, N,N-dimethylaminoethyl methacrylamide and a mixture thereof or (ii) at least one (meth) acrylic acid ester;

(B) N,N-diethylhydroxylamine; and

(C) N-nitroso-N-phenylhydroxylamine or its salt;

wherein a weight ratio of N,N-diethylhydroxylamine to N-nitroso- N-phenylhydroxylamine or its salt is from 1:1 to 10:1;

wherein a concentration of N,N- diethylhydroxylamine is 10 to 500 ppm based on the total weight of said stabilized monomer composition; and

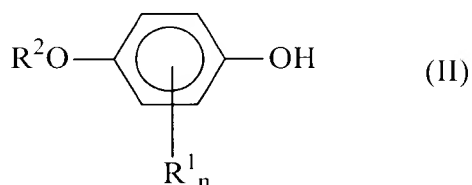
wherein a concentration of N-nitroso-N-phenylhydroxylamine or its salt is 10-500 ppm based on the total weight of said stabilized monomer composition.

2-11. (Canceled)

12. (Previously Presented) The composition according to Claim 1, wherein said salt of N-nitroso-N- phenylhydroxylamine is an ammonium salt, an aluminum salt, a copper salt, a lithium salt, a sodium salt, a potassium salt, or a rubidium salt.

13. (Previously Presented) The composition according to Claim 1, further comprising an inhibitor and/or an antioxidant.

14. (Previously Presented) The composition according to Claim 13, wherein said inhibitor is a dihydroxybenzene of Formula (II):

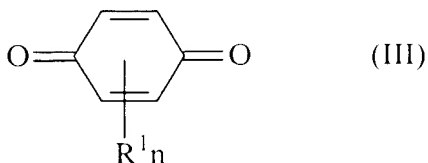


wherein R^1 is a straight-chain or branched alkyl group with one to eight carbon atoms, halogen or aryl;

n is an integer ranging from one to four; and

R^2 is hydrogen, a straight-chain or branched alkyl group with one to eight carbon atoms or aryl.

15. (Previously Presented) The composition according to Claim 13, wherein said inhibitor is a 1,4 benzoquinone of Formula (III):



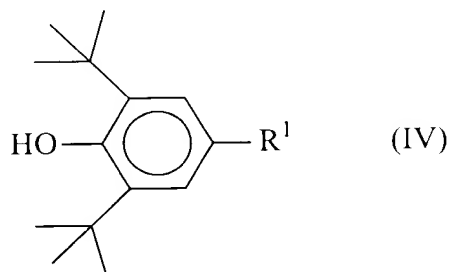
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where

R^1 is a straight-chain or branched alkyl group with one to eight carbon atoms, halogen or aryl; and

n is an integer ranging from one to four.

16. (Previously Presented) The composition according to Claim 13, wherein said inhibitor is a phenol of Formula (IV):



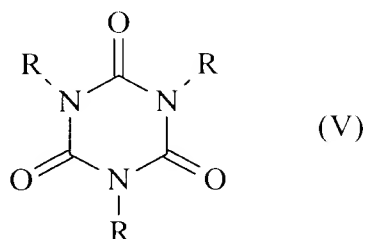
wherein

R^1 is a straight-chain or branched alkyl group with one to eight carbon atoms, aryl, aralkyl, a propionic acid ester group with a monohydric to tetrahydric alcohol optionally containing hetero atoms.

17. (Previously Presented) The composition according to Claim 13, wherein said

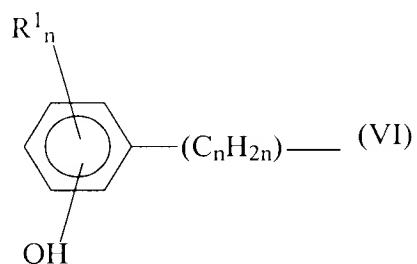
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inhibitor is a triazine derivative of Formula (V):



wherein

R = compound of Formula (VI)

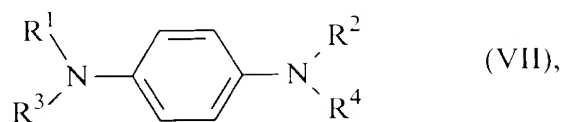


wherein

$R^n = C_nH_{2n+1}$; and

$n = 1$ or 2 .

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18. (Previously Presented) The composition according to Claim 13, wherein said inhibitor is a phenylenediamine of Formula (VII):

wherein

R^1 , R^2 , R^3 and R^4 independently are hydrogen or alkyl, aryl, alkaryl, aralkyl groups, each with up to 40 carbon atoms.

19. (Previously Presented) The composition according to Claim 18, wherein said phenylenediamine is selected from the group consisting of p-phenylenediamine, N-Phenyl-N'-alkyl-p-phenylene diamine, N-phenyl-N',N'-dialkyl-p-phenylenediamine, N,N-dialkyl-p-phenylenediamine, N,N'-dialkyl-p-phenylenediamine, N,N'-diaryl-phenylenediamine and N,N,N'-trialkyl-p-phenylenediamine.

20. (Previously Presented) The composition according to Claim 13, wherein said inhibitor is a phenazine dye selected from the group consisting of induline and nigrosine.

21. (Previously Presented) The composition according to Claim 13, wherein said inhibitor has a concentration of 0.01 to 0.5% by weight based on the total weight of said composition.

22. (Previously Presented) The composition according to Claim 1, further comprising a solvent.

23. (Previously Presented) The composition according to Claim 22, wherein said solvent is selected from the group consisting of benzene, toluene, n-hexane, cyclohexane, methyl isobutyl ketone, methyl ethyl ketone and mixtures thereof.

24. (Previously Presented) The composition according to Claim 1, further comprising an adjuvant.

25. (Previously Presented) The composition according to Claim 24, wherein said adjuvant is selected from the group consisting of an anti-binding agent, an antistatic, an antioxidant, a biostabilizer, a chemical propellant, a mold-release agent, a flame retardant, a lubricant, a dye, a casting improvement agent, a filler, a slip additive, an adhesion promoter, a catalyst, a photostabilizer, an optical brightener, an organic phosphorus compound, an oil, a pigment, an impact toughness improver, a reinforcing agent, a reinforcing fiber, an anti-weathering agent, a plasticizer and mixtures thereof.

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26. (Currently Amended) A process for synthesis of a stabilized monomer composition, comprising:

mixing

(A) (i) at least one ~~ethylenically unsaturated~~ (meth)acrylic acid amide selected from the group consisting of N,N-dimethylaminopropyl methacrylamide, N,N-dimethylaminoethyl methacrylamide and a mixture thereof or (ii) at least one (meth) acrylic acid ester,

(B) N,N-diethylhydroxylamine, and

(C) N-nitroso-N-phenylhydroxylamine or its salt; and

adding an inhibitor and/or antioxidant;

wherein a weight ratio of N,N-diethylhydroxylamine to N-nitroso-N-phenylhydroxylamine or its salt is from 1:1 to 10:1;

wherein a concentration of N,N- diethylhydroxylamine is 10 to 500 ppm based on the total weight of said stabilized monomer composition; and

wherein a concentration of N-nitroso-N-phenylhydroxylamine or its salt is 10-500 ppm based on the total weight of said stabilized monomer composition.

27. (Canceled)

28. (Previously Presented) The process according to Claim 26, further comprising adding a solvent.

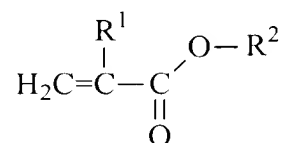
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29. (Previously Presented) The process of Claim 26, further comprising adding an adjuvant.

30. (Canceled)

31. (Canceled)

32. (Currently Amended) The process according to Claim ~~31~~ 26, wherein said ~~derivative of (meth)acrylic acid ester~~ is represented by Formula (1):



wherein

R¹ is hydrogen or a methyl group;

R² is a hydrogen, an aryl group, an aryl group containing hetero atoms, a saturated or unsaturated straight-chain, branched or cyclic alkyl group with up to 30 carbon atoms, or a saturated or unsaturated straight-chain, branched or cyclic alkyl group with up to 30 carbon atoms and containing hetero atoms.

33. (Previously Presented) The process according to Claim ~~31~~ 26, wherein said (meth)acrylic acid ester is a methyl (meth)acrylate, an ethyl (meth)acrylate, a propyl

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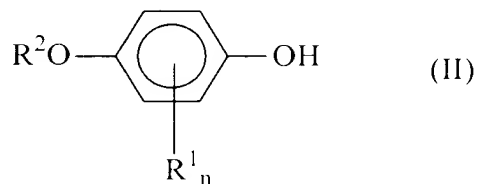
(meth)acrylate, an isopropyl (meth)acrylate, a n-butyl (meth)acrylate, an isobornyl (meth)acrylate, a hydroxyalkyl (meth)acrylate, an aminoalkyl (meth)acrylate or mixtures thereof.

34. (Previously Presented) The process according to Claim 33, wherein said hydroxyalkyl (meth)acrylate is selected from the group consisting of 2-hydroxyethyl (meth)acrylate, 2-hydroxypropyl (meth)acrylate, 3-hydroxypropyl (meth)acrylate, 3,4-dihydroxybutyl (meth)acrylate and mixtures thereof.

35-39. (Canceled)

40. (Previously Presented) The process according to Claim 26, wherein said salt of N-nitroso-N- phenylhydroxylamine is an ammonium salt, an aluminum salt, a copper salt, a lithium salt, a sodium salt, a potassium salt, or a rubidium salt.

41. (Previously Presented) The process according to Claim 26, wherein said inhibitor is a dihydroxybenzene of Formula (II):



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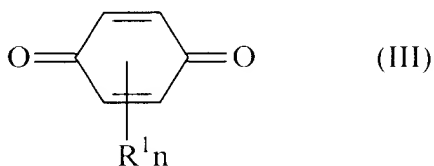
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wherein R^1 is a straight-chain or branched alkyl group with one to eight carbon atoms, halogen or aryl;

n is an integer ranging from one to four; and

R^2 is hydrogen, a straight-chain or branched alkyl group with one to eight carbon atoms or aryl.

42. (Previously Presented) The process according to Claim 26, wherein said inhibitor is a 1,4 benzoquinone of Formula (III):



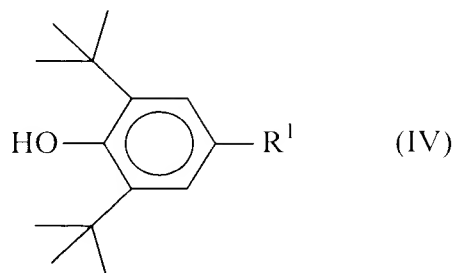
where

R^1 is a straight-chain or branched alkyl group with one to eight carbon atoms, halogen or aryl; and

n is an integer ranging from one to four.

43. (Previously Presented) The process according to Claim 26, wherein said inhibitor is a phenol of Formula (IV):

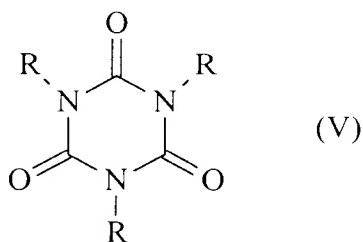
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wherein

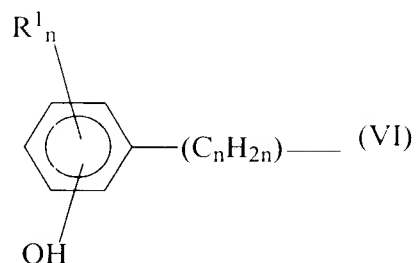
R¹ is a straight-chain or branched alkyl group with one to eight carbon atoms, aryl, aralkyl, a propionic acid ester group with a monohydric to tetrahydric alcohol optionally containing hetero atoms.

44. (Previously Presented) The process according to Claim 26, wherein said inhibitor is a triazine derivative of Formula (V):



wherein

R = compound of Formula (VI)

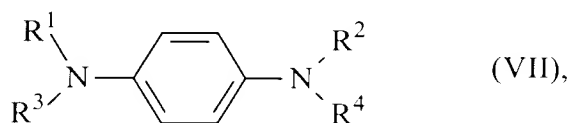


wherein

$R^1 = C_nH_{2n+1}$; and

$n = 1$ or 2 .

45. (Previously Presented) The process according to Claim 26, wherein said inhibitor is a phenylenediamine of Formula (VII):



wherein

R^1 , R^2 , R^3 and R^4 independently are hydrogen or alkyl, aryl, alkaryl, aralkyl groups, each with up to 40 carbon atoms.

46. (Previously Presented) The process according to Claim 45, wherein said

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phenylenediamine is selected from the group consisting of p-phenylenediamine, N-Phenyl-N'-alkyl-p-phenylene diamine, N-phenyl-N',N'-dialkyl-p-phenylenediamine, N,N-dialkyl-p-phenylenediamine, N,N'-dialkyl-p-phenylenediamine, N,N'-diaryl-phenylenediamine and N,N,N'-trialkyl-p-phenylenediamine.

47. (Previously Presented) The process according to Claim 26, wherein said inhibitor is a phenazine dye selected from the group consisting of induline and nigrosine.

48. (Previously Presented) The process according to Claim 26, wherein said inhibitor has a concentration of 0.01 to 0.5% by weight based on the total weight of said composition.

49. (Previously Presented) The process according to Claim 28, wherein said solvent is selected from the group consisting of benzene, toluene, n-hexane, cyclohexane, methyl isobutyl ketone, methyl ethyl ketone and mixtures thereof.

50. (Previously Presented) The process according to Claim 29, wherein said adjuvant is selected from the group consisting of an anti-binding agent, an antistatic, an antioxidant, a biostabilizer, a chemical propellant, a mold-release agent, a flame retardant, a lubricant, a dye, a casting improvement agent, a filler, a slip additive, an adhesion promoter, a catalyst, a photostabilizer, an optical brightener, an organic phosphorus compound, an oil, a pigment, an impact toughness improver, a reinforcing agent, a reinforcing fiber, an anti-weathering agent,

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a plasticizer and mixtures thereof.

51. (Withdrawn) A process for synthesis of a 2-hydroxyalkyl (meth)acrylate, comprising:

reacting an oxirane compound with (meth)acrylic acid in the presence of a catalyst;

adding at least one inhibitor;

adding the stabilized monomer composition according to Claim 1, thereby providing a mixture; and

distilling said mixture.

52. (Canceled)

53. (Withdrawn) The process according to Claim 51, wherein a concentration of N,N-diethylhydroxylamine is 10 to 500 ppm based on the total weight of said stabilized monomer composition; and

wherein a concentration of N-nitroso-N-phenylhydroxylamine or its salt is 10-500 ppm based on the total weight of said stabilized monomer composition.

54. (Withdrawn) The process according to Claim 51, wherein said oxirane is selected from the group consisting of ethylene oxide, propylene oxide, 1,2-butylene oxide, 2,3-butylene oxide, cyclohexene oxide, styrene oxide, 1,2,3,4-diepoxybutane, 1,2,5,6

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diepoxyhexane, epichlorhydrin, a glycidyl ester and mixtures thereof.

55. (Withdrawn) The process according to Claim 51, wherein said catalyst is selected from the group consisting of a chromium (III) carboxylate, a chromium (III) alkoxide, an iron (III) methacrylate and mixtures thereof.

56. (Withdrawn) The process according to Claim 51, wherein said process proceeds at a temperature of 15 to 90°C.

57. (Withdrawn) The process according to Claim 51, wherein said process proceeds at a pressure of 1 to 5 bar.

58. (Withdrawn) A method of purifying a 2-hydroxyalkyl (meth)acrylate, comprising:
adding at least one inhibitor to said 2-hydroxyalkyl (meth)acrylate;
adding the stabilized monomer composition according to Claim 1, thereby providing a mixture; and
distilling said mixture.

59. (Withdrawn) The method according to Claim 58, wherein said hydroxylalkyl (meth)acrylate is 2-hydroxyethyl acrylate.

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60. (Withdrawn) The method according to Claim 58, wherein a temperature of said distilling is 130 °C.

61. (Withdrawn) The method according to Claim 58, wherein a pressure of said distilling is 10 to 12 mbar.

62. (Canceled)

63. (Currently Amended) A stabilized monomer composition, comprising:

(A) (i) at least one ethylenically unsaturated monomer (meth)acrylic acid amide selected from the group consisting of N,N-dimethylaminopropyl methacrylamide, N,N-dimethylaminoethyl methacrylamide and a mixture thereof or (ii) at least one (meth) acrylic acid ester;

(B) N,N-diethylhydroxylamine;

(C) N-nitroso-N-phenylhydroxylamine or its salt; and

(D) a solvent selected from the group consisting of benzene, toluene, n-hexane, cyclohexane, methyl isobutyl ketone, methyl ethyl ketone and mixtures thereof;

wherein a weight ratio of N,N-diethylhydroxylamine to N-nitroso- N-phenylhydroxylamine or its salt is from 1:1 to 10:1;

wherein a concentration of N,N- diethylhydroxylamine is 10 to 500 ppm based on the

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total weight of said stabilized monomer composition; and

wherein a concentration of N-nitroso-N-phenylhydroxylamine or its salt is 10-500 ppm based on the total weight of said stabilized monomer composition.

64. (Withdrawn) A process for synthesis of a 2-hydroxyalkyl (meth)acrylate, comprising:

- reacting an oxirane compound with (meth)acrylic acid in the presence of a catalyst;
- adding at least one inhibitor;
- adding the stabilized monomer composition according to Claim 11, thereby providing a mixture; and
- distilling said mixture.

65. (Withdrawn) A method of purifying a 2-hydroxyalkyl (meth)acrylate, comprising:

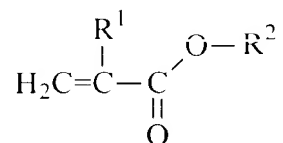
- adding at least one inhibitor to said 2-hydroxyalkyl (meth)acrylate;
- adding the stabilized monomer composition according to Claim 11, thereby providing a mixture; and
- distilling said mixture.

66. (Withdrawn) A process for synthesis of a 2-hydroxyalkyl (meth)acrylate, comprising:

reacting an oxirane compound with (meth)acrylic acid in the presence of a catalyst;
adding at least one inhibitor;
adding the stabilized monomer composition according to Claim 63, thereby providing
a mixture; and
distilling said mixture.

67. (Withdrawn) A method of purifying a 2-hydroxyalkyl (meth)acrylate,
comprising:
adding at least one inhibitor to said 2-hydroxyalkyl (meth)acrylate;
adding the stabilized monomer composition according to Claim 63, thereby providing
a mixture; and
distilling said mixture.

68. (New) The stabilized monomer composition according to Claim 1, wherein said
(meth)acrylic acid ester is represented by Formula (1):



wherein

R¹ is hydrogen or a methyl group;

R² is a hydrogen, an aryl group, an aryl group containing hetero atoms, a saturated or

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unsaturated straight-chain, branched or cyclic alkyl group with up to 30 carbon atoms, or a saturated or unsaturated straight-chain, branched or cyclic alkyl group with up to 30 carbon atoms and containing hetero atoms.

69. (New) The stabilized monomer composition according to Claim 1, wherein said (meth)acrylic acid ester is a methyl (meth)acrylate, an ethyl (meth)acrylate, a propyl (meth)acrylate, an isopropyl (meth)acrylate, a n-butyl (meth)acrylate, an isobornyl (meth)acrylate, a hydroxyalkyl (meth)acrylate, an aminoalkyl (meth)acrylate or mixtures thereof.

70. (New) The stabilized monomer composition according to Claim 69, wherein said hydroxyalkyl (meth)acrylate is selected from the group consisting of 2-hydroxyethyl (meth)acrylate, 2-hydroxypropyl (meth)acrylate, 3-hydroxypropyl (meth)acrylate, 3,4-dihydroxybutyl (meth)acrylate and mixtures thereof.

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BASIS FOR THE AMENDMENT

Claims 2, 30, 31, and 35-39 have been canceled.

Claim 1 has been amended as supported by Claims 2 and 3 as originally filed.

Claim 26 has been amended as supported by Claims 2 and 7 as originally filed.

Claim 63 has been amended as supported by Claims 2, 3 and 7 as originally filed.

New Claims 68-70 have been added as supported by Claims 4-6 as originally filed.

No new matter is believed to have been added by entry of this amendment. Entry and favorable reconsideration are respectfully requested.

Upon entry of this amendment Claims 1, 12-26, 28, 29, 32-34, 40-51, 53-61, 63-70 will now be active in this application. Claims 51, 53-61 and 64-67 stand withdrawn from further consideration as being drawn to non-elected subject matter.